

Name: Solutions

1. Simplify $\frac{4}{a+b} - \frac{b}{a^2+ab} = \frac{a \cdot 4}{a(a+b)} - \frac{b}{a(a+b)} = \frac{4a-b}{a^2+ab}$

2. Simplify: $\frac{h-1}{h^2+7h} + \frac{h+5}{h+7} = \frac{h-1}{h(h+7)} + \frac{h(h+5)}{h(h+7)} = \frac{h-1+h^2+5h}{h(h+7)}$
 $= \frac{h^2+6h-1}{h^2+7h}$

3. Simplify: $\frac{h-1}{h^2+7h} - \frac{h+5}{h} = \frac{h-1}{h(h+7)} - \frac{(h+5)(h+7)}{h(h+7)} = \frac{h-1-(h^2+12h+35)}{h^2+7h}$
 $= \frac{h-1-h^2-12h-35}{h^2+7h} = \frac{-h^2-11h-36}{h^2+7h}$

4. Simplify: $\frac{h-1}{h+7} + \frac{h+5}{h} = \frac{h(h-1)}{h(h+7)} + \frac{(h+5)(h+7)}{h(h+7)} = \frac{h^2-h+h^2+12h+35}{h^2+7h}$
 $= \frac{2h^2+11h+35}{h^2+7h}$

5. Simplify: $\frac{f+1}{f^2+3f} - \frac{f}{2f+6} = \frac{f+1}{f(f+3)} - \frac{f}{2(f+3)} = \frac{2(f+1)}{2f(f+3)} - \frac{f(f)}{f \cdot 2(f+3)}$
 $= \frac{2f+2-f^2}{2f^2+6f} = \frac{-f^2+2f+2}{2f^2+6f}$

$$6. \text{ Simplify } \frac{4}{a-b} + \frac{1}{b-a} = \frac{4}{a-b} + \frac{1}{-(a-b)} = \frac{4}{a-b} - \frac{1}{a-b} = \frac{3}{a-b}$$

$$7. \text{ Simplify } \frac{2x}{x+1} - \frac{x+3}{x} = \frac{x(2x)}{x(x+1)} - \frac{(x+1)(x+3)}{(x+1)(x)} = \frac{2x^2 - (x^2 + 4x + 3)}{x^2 + x}$$

$$= \frac{2x^2 - x^2 - 4x - 3}{x^2 + x} = \frac{x^2 - 4x - 3}{x^2 + x}$$

$$8. \text{ Simplify } \frac{5}{x+6} + \frac{4}{x-1} = \frac{(x-1)(5)}{(x-1)(x+6)} + \frac{(x+6)(4)}{(x+6)(x-1)} = \frac{5x - 5 + 4x + 24}{x^2 + 5x - 6}$$

$$= \frac{9x + 19}{x^2 + 5x - 6}$$

$$9. \text{ Simplify } \frac{4}{x+2} - 5 = \frac{4}{x+2} - \frac{(x+2)(5)}{(x+2)(1)} = \frac{4 - 5(x+2)}{x+2}$$

$$= \frac{4 - 5x - 10}{x+2} = \frac{-5x - 6}{x+2}$$

$$10. \text{ Simplify } \frac{b-1}{b} - \frac{3}{b-2} + 1 = \frac{(b-2)(b-1)}{(b-2)(b)} - \frac{b(3)}{b(b-2)} + \frac{b(b-2)(1)}{b(b-2)(1)}$$

$$= \frac{b^2 - 3b + 2 - 3b + b^2 - 2b}{b^2 - 2b} = \frac{2b^2 - 8b + 2}{b^2 - 2b}$$